



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/809,842	03/26/2004	Yoshinori Kida	SNY-055	8150

20374 7590 07/17/2007  
KUBOVCIK & KUBOVCIK  
SUITE 710  
900 17TH STREET NW  
WASHINGTON, DC 20006

EXAMINER
----------

DOVE, TRACY MAE

ART UNIT	PAPER NUMBER
----------	--------------

1745

MAIL DATE	DELIVERY MODE
-----------	---------------

07/17/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/809,842	<b>Applicant(s)</b> KIDA ET AL.	
	<b>Examiner</b> Tracy Dove	<b>Art Unit</b> 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 26 April 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3,5,7,9,11,13,15,17,19 and 20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,5,7,9,11,13,15,17,19 and 20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

This Office Action is in response to the communication filed on 4/26/07. Applicant's arguments have been considered, but are not persuasive. Claims 1, 3, 5, 7, 9, 11, 13, 15, 17, 19 and 20 are pending. This Action is FINAL

#### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 9, 11, 13 and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 9, 11, 13 and 15 recite "γ-butyrolactone and sulfolane as a main solvent", which is indefinite. It appears Applicant is attempting to claim a solvent wherein sulfolane is contained in the greatest percentage of any solvent contained in the total solvent. However, claim 1 recites as little as 20 vol% of sulfolane may be contained in the solvent. Furthermore, the term "main" is a relative term the renders the claims indefinite. Applicant states the term "main is not relative and would be understood by a person of ordinary skill in the art to have its common meaning as "more than 50%". However, claim 1 requires the sulfolane to be in an amount of 20-45 vol%.

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

Art Unit: 1745

such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3, 5, 7, 9, 11, 13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatazaki et al., US 2001/0038949.

Hatazaki teaches a non-aqueous secondary battery having excellent charge/discharge characteristics and a long cycle life comprising a positive electrode, a negative electrode and a non-aqueous electrolyte including a non-aqueous solvent and a solute (abstract). The negative electrode includes a carbon active material (0057-0059). The solvent may consist of 80% of  $\gamma$ -butyrolactone (0011). It is preferable that at least one selected from the group consisting of a carbonic acid ester type additive and a sulfur compound type additive is further added to the non-aqueous electrolyte (0012-0014). The amount of carbonic acid ester additive and/or sulfur compound additive is preferably 0.1-10 parts by weight per 100 parts by weight of the non-aqueous electrolyte (0049). In the case where the carbonic acid ester type additive and the sulfur compound type additive are used at the same time, preferable ratio of carbonic acid ester to sulfur compound is 1:9 to 9:1 (0050). The carbonic acid ester additive may be vinylene carbonate and/or vinylethylene carbonate. Vinylene carbonate is a particularly preferred carbonic acid ester additive (0047). Sulfolane is a preferred sulfur compound additive (0048).

Hatazaki does not explicitly state sulfolane is contained in an amount of 20-45 % by volume based on the total volume of the solvent. However, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because claims that differ from the prior art only by slightly different (non-overlapping) ranges are prima facie obvious without a showing that the claimed range achieves unexpected results relative to the prior art. See *In re Woodruff*, 16 USPQ2d 1935, 1937 (Fed. Cir. 1990). See also *In re*

Art Unit: 1745

Huang, 40 USPQ2d 1685 (Fed. Cir. 1996). Claimed ranges of a result effective variable, which do not overlap the prior art ranges, are unpatentable unless they produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art.

Furthermore, the courts have ruled where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. In re Swain et al., 33 CCPA 1250, 156 F.2d 239, 70 USPQ 412. The courts have held that a limitation merely with respect to proportions in a composition of matter or process will not support patentability unless such limitation is “critical”. Minerals Separation, Ltd. v. Hyde, 242 U.S. 261 (1916).

In addition, it is unclear if Hatazaki teaches the added limitation of sulfolane “in an amount of 20-45 % by volume, on the basis of the total volume of the solvent” because Hatazaki does not teach the amount of sulfolane based on the volume percentage of only the solvent. Hatazaki teaches the amount of sulfolane based on the weight percentage of the entire electrolyte (not just the solvent).

\*

Claims 17, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatazaki et al., US 2001/0038949 in view of Kameda et al., US 6,632,569.

Hatazaki teaches a non-aqueous secondary battery having excellent charge/discharge characteristics and a long cycle life comprising a positive electrode, a negative electrode and a non-aqueous electrolyte including a non-aqueous solvent and a solute (abstract). The negative electrode includes a carbon active material (0057-0059). The solvent may consist of 80% of  $\gamma$ -butyrolactone (0011). It is preferable that at least one selected from the group consisting of a

Art Unit: 1745

carbonic acid ester type additive and a sulfur compound type additive is further added to the non-aqueous electrolyte (0012-0014). The amount of carbonic acid ester additive and/or sulfur compound additive is preferably 0.1-10 parts by weight per 100 parts by weight of the non-aqueous electrolyte (0049). In the case where the carbonic acid ester type additive and the sulfur compound type additive are used at the same time, preferable ratio of carbonic acid ester to sulfur compound is 1:9 to 9:1 (0050). The carbonic acid ester additive may be vinylene carbonate and/or vinylethylene carbonate. Vinylene carbonate is a particularly preferred carbonic acid ester additive (0047). Sulfolane is a preferred sulfur compound additive (0048).

Hatazaki is silent regarding the intensity ratio of the carbon material of the negative electrode.

However, Kameda teaches a non-aqueous solvent secondary battery comprising a carbon negative electrode active material. The carbon material has a plane space d002 of a (002) plane less than 0.337 nm, a crystallite size (Lc) of 90 nm or higher and an R value, as a peak intensity ratio of a peak intensity of  $1360\text{ cm}^{-1}$  to a peak intensity of  $1580\text{ cm}^{-1}$  in a Raman spectrum of 0.20 or higher (abstract).

Therefore, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because one of skill would have been motivated to use the carbon material of Kameda for the carbon material of Hatazaki. Both Kameda and Hatazaki are directed toward non-aqueous solvent electrolyte secondary batteries having carbon negative electrode active material. One of skill would have been motivated to substitute the carbon material of Kameda for the carbon material of Hatazaki in order to improve the battery

Art Unit: 1745

capacity, prevent irreversible capacity admitted in the initial battery cycle and improve quick charging and discharging characteristics (abstract of Kameda).

***Response to Arguments***

Applicant's arguments filed 4/26/07 have been fully considered but they are not persuasive. See above for discussion of 35 U.S.C. 112, 2<sup>nd</sup>, rejection and rebuttal arguments.

Regarding Hatazaki, Applicant argues one of skill in the art would not have been motivated to modify Hatazaki to reach the claimed invention because sulfolane is disclosed only as an "additive". It is unclear how this argument overcomes the rejection of record. Applicant's assertion that one of skill would not have been motivated to add at least 20 vol % of an element disclosed in a reference as an "additive" is not supported by evidence.

Applicant argues Hatazaki discloses that the amount of the at least one additive is 0.1-10 parts by weight. However, Applicant fails to mention that Hatazaki discloses the amount of the at least one additive is 0.1-10 parts by weight of the entire electrolyte (not just the solvent component of the electrolyte). Furthermore, Applicant's comparison of the additive amount of Hatazaki and the claimed amount of sulfolane is improper. One cannot know the volume percentage of sulfolane based on the amount of total solvent contained in the electrolyte of Hatazaki without knowing the entire composition of the electrolyte so that a proper conversion can be calculated. The assertion that the amount of sulfolane of 20-45 vol% as recited in claim 1 is significantly greater than 10 parts by weight of sulfolane because the specific gravity of sulfolane is not large is without support. It is unclear how Applicant reaches this assertion. Applicant's arguments are based upon an incorrect comparison of the claimed invention and the prior art of record, thus, the arguments are not persuasive. Furthermore, the claimed invention is

Art Unit: 1745

prima facie obvious without a showing that the claimed range achieves unexpected results relative to the prior art.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tracy Dove whose telephone number is 571-272-1285. The examiner can normally be reached on Monday-Thursday (9:00-7:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

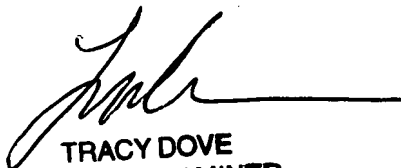
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished



Art Unit: 1745

applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

July 10, 2007



TRACY DOVE  
PRIMARY EXAMINER